



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 09/817,559
Filing Date: March 26, 2001
Applicant: Peachee et al.
Group Art Unit: 2834
Examiner: Julio C. Gonzalez
Title: SENSORLESS SWITCHED RELUCTANCE ELECTRIC
MACHINE WITH SEGMENTED STATOR
Attorney Docket: 3174-000003

Box [Non-Fee Amendment]
Commissioner of Patents and Trademarks
Washington, D.C. 20231

DECLARATION OF DR. RICHARD S. WALLACE
UNDER 37 C.F.R § 1.132

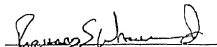
I, Dr. Richard S. Wallace, hereby declare that:

- 1) I am an Engineer for Emerson Electric Co. and one of the named inventors of the above-identified U.S. Patent Application.
- 2) While working at Emerson Electric Co., I helped design a switched reluctance machine with a non-segmented stator.
- 3) I have reviewed Japanese Patent to Oki (JP Pat. No. 411289701A) (hereinafter "Oki") and an English translation of Oki.
- 4) I calculated the slot fill of the reluctance machine in Oki as follows:

- a) I scanned and enlarged FIG. 1 of Oki.
 - b) Using CAD tools, I drew a circle that intersects inner edges of the stator teeth and a radial line that intersects a border between adjacent stator teeth.
 - c) Using the radial line, the circle and the stator tooth, I calculated the total possible area that could be used for winding wire, excluding area occupied by tooth insulation.
 - d) I then calculated the effective area that is occupied by the winding wire of Oki, including the unfilled areas between round wires.
 - e) I divided the effective winding wire area by the total possible area. The result was 62% slot fill.
- 5) I am not aware of any sensorless control systems for brushless permanent magnet machines and/or induction machines that operate properly if the iron core is heavily saturated with magnetic flux.
- 6) Switched reluctance machines, on the other hand, are frequently operated with levels of magnetic flux in their iron cores that exceed the levels used in other types of electric machines. I am aware of sensorless control systems for switched reluctance machines that do operate properly if the iron core is heavily saturated with magnetic flux.
- 7) By segmenting the stator and increasing slot fill of the switched reluctance machine, the diameter of the winding wire can be increased using the same number of turns.

- 8) The increased diameter of the winding wire allows increased current to be driven through the windings, which increases torque output.
- 9) The increased current levels also increase magnetic loading and magnetic saturation.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.


Dr. Richard S. Wallace

24 Feb 2003
Date